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LAMBOOZLED!: The design and development of a game-based approach to news literacy education

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ABSTRACT

Given the need for innovative, engaging, and youth-centered approaches to media literacy, as well as the potential of active pedagogies to facilitate youth civic education and efficacy, games emerge as a particularly promising and under-utilized avenue for news literacy education. Our research asks, how might we use game-based learning to tackle fake news and stimulate news literacy among a youth audience? Here, we reflect on the process of designing LAMBOOZLED!, a news literacy game for middle school and high school students, based on a multilevel game design framework that allowed us to articulate learning objectives, consider suitable mechanics, dynamics and aesthetics, and integrate relevant instructional principles along multiple learning dimensions. Positioning this work at the nexus of game design and media literacy education, we discuss our key decision points and the larger stakes of adopting a game-based approach to news literacy education in the current political climate.

Keywords: *media literacy, fake news, game-based learning, iterative design, youth*.

INTRODUCTION

The prominent rise of misinformation and "fake news"[1] within the contemporary sociopolitical and technological climate (Dimock, 2019; Shearer & Matsa, 2018) is shining a spotlight onto the critical significance of media literacy education among all demographics but especially among youth. Recent empirical research has documented a concerning lack of media literacy among youth (Breakstone et al., 2019; Robb, 2017; Stringer, 2018); in particular, news literacy – understood as the knowledge and motivations needed to access, evaluate, analyze, and create news media products (Ashley et al., 2013; Maksl et al., 2015) – is a significant area of concern. In a survey by Common Sense Media, 31% of American youth aged 10-18 said they shared a news story that they later learned was fake, and 56% felt they cannot reliably tell fake news stories from real ones (Robb, 2017). Furthermore, young people feel disconnected from and cynical about the news: their trust in news and in journalists is low (CIRCLE, 2018; Media Insight Project, 2018), and they do not feel that news is relevant to them (CIRCLE, 2018; Robb, 2017).

Within this context, the need for media literacy education that is appealing, effective, and relevant to youth becomes critical. As Kiesa & Vito (2018) argue, media literacy is not just a necessary skill related to information consumption and production – it is a cornerstone of youth civic engagement. However, current media literacy education initiatives lag behind and face substantial challenges (Bulger & Davison, 2018; Culver & Redmond, 2019) in terms of lack of resources, content relevance, time allotment, and fit into the curriculum. Additionally, the charged nature of the current political landscape – in the United States and elsewhere – complicates the implementation of media literacy efforts in classrooms (Stringer, 2018) while at the same time foregrounding the need for such efforts.

Recent voices in the field have emphasized the need for youth-centered and participatory approaches to media literacy (Kiesa & Vito, 2018), which are especially important given young people's lack of trust in the news and perceived lack of relevance (CIRCLE, 2018; Media Insight Project, 2018; Robb, 2017). In particular, research has shown that interactivity and active pedagogies can play a significant role in facilitating youth civic education and efficacy (Ballard et al., 2016). Within this context, games emerge as a particularly promising and under-utilized avenue for media literacy education (Basol et al., 2020; Foxman, 2015; Literat et al., 2020; Wilson et al., 2017). Our research, therefore, asks, how might we use game-based learning to tackle fake news and stimulate news literacy among a youth audience? Here, we reflect on the process of designing and developing *LAMBOOZLED!*, a news literacy game for middle school and high school students, and discuss the larger stakes of adopting a game-based approach to news literacy education.

Conceptual Framework

The theoretical framework put forward by Aleven et al. (2010) guided our approach to the game design process. Their framework consists of three interrelated components of game design – learning objectives, Mechanics-Dynamics-Aesthetics, and Instructional Design Principles – and a strategy for combining them within the process of educational game design. The authors suggest placing a deliberate focus on each of these components within the game design process while keeping in mind how they might reinforce – or conversely, destabilize – each other as the game takes shape.

In the following, we illustrate the application of this framework by reflecting on each of its three areas of focus throughout our game design process.

Learning objectives focus: Determining the educational goals of the game

In crystallizing the learning goals of our game, we conducted a comprehensive and interdisciplinary literature review of empirical and theoretical research on youth media consumption and news literacy with a particular focus on the educational gaps and areas of opportunity identified by this literature. Based on this review, we condensed our learning objectives around two key concepts that emerged as particularly salient for our target demographic: the concept of truth and bias as related to news media, and the deployment of both declarative and procedural knowledge (Smith, 1994) in the detection of misinformation.

[1] While acknowledging the wide variance in both popular and academic uses of the term "fake news" (Shu et al., 2017; Tandoc et al., 2018), we refer to Allcott & Gentzkow's (2017) widely used definition of fake news as "articles that are intentionally and verifiably false and could mislead readers" (p. 213).

Our game design, therefore, aimed to highlight the value of critically assessing information in a post-truth era, which requires acknowledging both authorial bias and a sociocultural construction of real and fake news (Lloyd, 2012; Mooney, 2018). Furthermore, while instructional content around fake news detection often focuses on the deployment of declarative knowledge (e.g., spotting a fake title or an odd-looking URL), research on online news consumption practices also highlights the need to go beyond the news story itself and consider the entire ecosystem of news and investigative strategies available to the reader (Burkhardt, 2017; Shu et al., 2017). For instance, focusing specifically on news encountered on social media – which is by far young people's preferred news consumption environment (Robb, 2017) – Shu et al. (2017) noted the significance of auxiliary information, such as scrutinizing the user or account that posted the article, in properly appraising the veracity of news. Such investigative strategies are an example of procedural knowledge with respect to identifying misinformation. Our game aimed to cultivate both *declarative knowledge* (e.g., does the URL look legitimate?) and *procedural knowledge* (e.g., what is this source's reputation? What do other news sources say?) as a more holistic approach to the detection of misinformation.

In terms of target audience and practical implementation, the game was primarily designed for middle school and high school students in view of the current news literacy challenges that these demographics face (Breakstone et al., 2019; Robb, 2017), and the noted urgency of targeting them with effective and engaging media literacy initiatives (Bulger & Davison, 2018; Culver & Redmond, 2019; Tugend, 2020). In terms of implementation setting, while we aimed to facilitate a diversity of contexts of play, we acknowledge that the game would most likely be played in formal or informal educational settings. Therefore, we aimed to keep barriers of adoption low, settling on a card-based game, in order to increase accessibility and ease of classroom implementation.

Mechanics-Dynamics-Aesthetics focus: Turning learning objectives into game mechanics

Once we reached a collective understanding of the learning objectives we aimed to convey in the game, we used the Mechanics-Dynamics-Aesthetics (MDA) framework (Buttfield-Addison et al., 2016; Hunicke et al., 2004) to put these into practice. Within this framework, *mechanics* describes the rules and "actions" of the game, *dynamics* describes the qualities of the system during play, and *aesthetics* involves the emotional responses of the player.

Our brainstorming and prototyping process included an iterative approach to instructional design. Following Jonassen (2008), we approached the design process as a series of iterative steps that involve discovering new constraints and opportunities, developing design solutions, testing, and revision. Within this model, in each iteration, designers can test their assumptions about the design in an authentic context and have the opportunity to identify and revise less effective design solutions. In the case of game design, testing and iteration are especially important, as the dynamics of the game can only be observed through actively testing the design solution.

The game largely went through four iterations based on the findings from several rounds of playtesting with relevant stakeholders. This included playtesting sessions with instructional designers, game designers, media literacy researchers and educators, and, importantly, with our target audience of middle school and high school students. Youth were invited to play different iterations of the game and provide feedback in various contexts, including formal settings (e.g., playing the game in their classrooms as facilitated by their teachers) and informal settings (e.g., demonstration expos and participatory game design workshops; see Literat et al., 2020 for a discussion of the latter).

In each iteration of the game, certain aspects, or sometimes the core game mechanics, were revised in order to address the limitations observed in playtesting. More specifically, the decision to revise the game design was made if the mechanics, dynamics, and aesthetics, as observed in these diverse playtesting contexts, were not effectively supporting the learning objectives. The Aleven et al. (2010) framework, as a guiding conceptual approach, was very helpful in this process. For example, playtesting revealed that an early iteration of the game foregrounded the declarative features of fake news at the expense of procedural knowledge; we, therefore, introduced a Context Card (see Figure 1) to provide additional information about the source and story and encourage players to deploy procedural knowledge (e.g., investigating the source's reputation profile or verifying evidence in the story) in the identification of fake news. Similarly, another iteration included analogous mechanisms to familiar games (i.e., *Rock, Paper, Scissors*) to simplify gameplay. However, we quickly noted that the design, while easier to understand, suggested that one type of media literacy skills is better

than others – which is not substantiated by literature and not congruent with our learning objectives. Considering these correlations between our learning objectives and MDAs at every step of the design process pushed us to develop new mechanics that fully reflected our learning objectives (see Table 1); together, these destabilizing aspects led us to an improved design as described in more detail below. Finally, while previous prototypes included additional game materials (like a board game, tokens, and pawns), we eliminated these in the final iteration in an effort to lower barriers to distribution and implementation. The final game consisted entirely of standard poker-sized playing cards, which are cheap to produce or even to print out and cut.

The resulting game, *LAMBOOZLED!* (named because of the fictional sheep narrative at the center of the game; see a larger discussion of this choice in the next section of the article) included four types of cards: 1) *news cards*, 2) *context cards*, 3) *evidence cards*, and 4) *action cards* (see Figure 1).

Figure 1. Examples of *News*, *Context*, *Evidence*, and *Action Cards*

News cards consist of fictional headlines with a variety of information, which may include a publisher, author, and URL, while *context cards* show the external information available to players, such as the source's previous posts, their reputation profiles as suspicious or credible sites, reverse image searches, verified social media profiles or lack thereof, etc. *Evidence cards* have a point value from one to three and an argument regarding whether the news card is fake or real. 1-point cards refer to features that are directly observable on the news card, while 2- and 3-point cards refer to the context card. Finally, *action cards* have a variety of fun and strategic effects, such as allowing players to draw more cards, steal from each other, and switch hands with another player.

At the beginning of gameplay, one news card and four context cards are drawn and made visible to all players, while each individual player is dealt five cards from the evidence deck (which has action cards mixed in). Play proceeds in a turn-based fashion. On their turn, a player may draw a new card from the evidence deck, play an action card to further their game or weaken opponents' hands, or "drop" a set of evidence arguing for either the veracity or falsehood of the central news card, thereby forcing all other players to present their best evidence as well. The player with the strongest set of evidence (i.e., highest point total) wins the round. If other players believe that one of the winner's evidence cards is not applicable, they may challenge them and prompt a debate. Once a round's winner is decided, new context and news cards are drawn and play continues. For more details on gameplay, see the full rules and tutorial video on the game website[2].

In determining the card categories, we considered the entire ecosystem of (fake) news, where it is important to investigate not only the news article itself but also the larger context of the news source and the story being reported. This conceptualization informed the types of evidence that players can use in the game, and their incarnation in our cards: internal evidence related to the news article itself (e.g., observable features of a news story such as its title, its URL, or its byline, 1 point evidence cards), external evidence related to the source (examining the source's identity, bias, and motivations, 2 point evidence cards), and external evidence related to the news story (e.g., verification of evidence in the story or triangulation with other news sources, 3 point evidence cards). This approach was in line with our aim of fostering the deployment of both

[2] See www.lamboozled.com

declarative and procedural knowledge (see Table 1); furthermore, in writing out the content of each card, we ensured that each strategy is based on empirical findings and best practices from the interdisciplinary body of literature consulted, as described in the previous section, and we tracked these correlations in a spreadsheet containing the master list of cards with respective references.

Table 1. *Overview of learning objectives and game mechanics*

Learning Objective	Translation into Game Mechanics
Understanding bias	Combining information about the source (i.e. 2-point evidence cards about source's background, identity, motivations, previous activity) with information about the news story posted Applying internal (1 point) evidence card to the content and formatting of the central news card
Deploying declarative knowledge	Applying internal (1 point) evidence cards to news cards Possibility of challenging and defending the applicability of declarative evidence, settled by debate and voting
Deploying procedural knowledge	Applying source (2pts) and story (3pts) evidence cards to context cards Arguing for or against the veracity of news stories by using as much applicable evidence as possible: i.e. playing "hands of evidence" rather than single evidence cards

Instructional principles focus: Integrating best practices from game design and media literacy research

Incorporating different strands of research on games and learning, instructional design principles encourage designers to consider whether the game supports learning in ways that are consistent with empirical research (Aleven et al., 2010). For us, this meant integrating relevant instructional principles from both game design (Gee, 2004) and media literacy (Hobbs, 2010). By integrating these instructional principles and checking them against our game design at multiple stages in the process, we were able to substantiate and determine the alignment of our emerging game prototype with existing best practices.

Gee's (2004) principles of good game-based learning focus on empowering learners to master problem-solving and understanding skills through the use of contrived experiences which simulate real-world systems. The most salient tenets which shaped our game design process (see Table 2) included the *sandbox* principle, where players can experiment with concepts in a guided environment; the *fish tank mechanism* and *systems thinking* principles, which enable a holistic understanding of complex systems; the *skills as strategies* principle that allowed players to deploy knowledge advantageously in the game. Finally, these skills and strategies are perfected through multiple rounds of play – Gee's *cycles of expertise* principle – which deepens the understanding of key concepts through repeated gameplay.

Hobbs' (2010) instructional principles for media literacy education also informed our approach (Table 3). The first key tenet that we implemented was a focus on *reading, viewing, listening and discussing.* This was achieved through several mechanisms, including the design and use of the evidence cards: in the game, players must first read the news article and media literacy clues on the evidence cards, then devise a strategy for how to use the card, read their evidence out loud – for other players to hear – when they submit their evidence, and engage in debate in the case of a challenge or tie. Second, *gaming, simulation and role-playing* were embedded in the very nature of the game, as a simulation of real-world experiences and skills. Finally, *close analysis,* a contextualized appraisal of the content and author's objective, was captured in our game explicitly through the use of evidence cards (e.g., about author bias and intent) that relate to both the news source and the news story.

Table 2. *Guiding instructional principles from game design (Gee, 2004)*

Principle	Description	Reflection in our game
Sandbox principle	Safe learning environments allow players to test new skills before using them in the real-world.	Applying fictional evidence to fictional news stories facilitates the practice of media literacy skills in a low-stakes environment, while also enabling transfer to players' real-world experiences.
Fish tank	Simplified learning environment that illuminates key skills and facilitates learning	The creation of a fictional environment (i.e., the sheep town of Green Meadows) as the setting of the game, and the introduction of fictional sheep news, rather than real-world news stories, enable players to focus on key features and skills, without the distractions of (politicized, and objectively true or false) real-world news.
Systems thinking	Skills that are instantiated in environmental context improve player learning.	The use of explicit media literacy skills, (via the Evidence Cards) in simulated news environments (from the News and Context cards) ensures that individuals understand the environment in which the skills can be used.
Skills as strategies	The contextualized use of key skills aids a player's in-game strategy.	Winning a round is incumbent on deploying media literacy skills, manifested via the strategic use of Evidence Cards that apply to the central News and Context Cards.
Cycles of expertise	Repeated rounds of gameplay focus players on key skills and facilitate mastery.	Play consists of multiple quick rounds, each centered around newly drawn News, Context and Evidence Cards. Repeated chances to build one's evidence increase mastery, while exposure to different News, Context and Evidence Cards convey a wide range of skills and examples.

Table 3. *Guiding instructional principles from media literacy education (Hobbs, 2010)*

Principle	Description	Reflection in our game
Reading, viewing, listening and discussing	Mechanisms for evaluation of content and shared discourse support deep learning of media literacy skills.	Evidence cards encourage players to pay close attention to both the news article and the media literacy strategies available for use as evidence; the latter are then read out loud when played. Finally, discussion and debate is encouraged between players, who argue for and against the veracity of the news and the applicability of the evidence in play.
Gaming, simulation and role-playing	Experiential learning modalities like games support the reasoning and use of media literacy skills.	The game provides a fun simulation of a news ecosystem, where players come to understand various layers of journalism (related to the article, source and larger story) and learn to use clues and news literacy strategies accordingly
Close analysis	Skillful questioning and appraisal of media content is important in determining authorial bias.	Through multiple rounds of game-play, players learn how to appraise authorial bias and apply Evidence Cards to deploy both declarative and procedural knowledge.

Points of tension and opportunity in the design process

Throughout the iterative game design process, we identified a series of key tensions – representing, at once, both challenges and opportunities for the development of the game – that we believe would benefit from further explication.

As we and others have noted (Chang et al., 2020; Mihailidis, 2018; Toppo, as cited in Stringer, 2018), being involved in media literacy education today means necessarily having to grapple with the political – and politicized – aspect of our work. Therefore, a problematic classroom implementation issue that we considered early in our design process was the potential for political conflict – especially given the polarization that characterizes schools today (Rogers, 2017).

Our approach was to make the setting and content of the game decidedly non-political by framing the game within the fictionalized setting of Green Meadows, populated with news-reading sheep. Our reasons for doing so were two-fold: first, as explained above, the current political environment, especially around the term "fake news" as a political rallying cry, meant that utilizing real news or current events as the basis for the game could create undesirable tension between players and be a distraction from the key learning goals. The sheep setting created psychological distance to allow players to engage with the concept of fake news in a less polarizing context, a technique with demonstrated effectiveness in persuasive games (Kaufman et al., 2016). Second, using fictional news stories freed us from the constraints of there being a set correct answer regarding whether any given story was "real" or "fake," allowing that determination to be made by the players within the game, using their available evidence each round. In other words, it allowed us to shift the game's focus from the news itself to the *strategies* one would use to make that real vs. fake determination.

While our playtests indicated that this non-political fictional approach worked well and seemed to be appreciated by both youth and educators (Chang et al., 2020), the flip side of the coin is that this fictional approach also prevented us from anchoring the game within the everyday lives and cultural worlds of young people – which we know is an effective and appealing strategy for media literacy education (Kiesa & Vito, 2018; Literat et al., 2020; Mihailidis, 2018). In designing the content of the game – especially in terms of the content of *News Cards* – we, therefore, considered the tension between relevance and abstraction or fictionalization. On the one hand, we aimed to design a game that feels relevant to today's youth and would have liked to incorporate news they care about, especially given their perceived lack of relevance (CIRCLE, 2018; Robb, 2017), in formats that they are used to. We, thus, debated about the potential inclusion of mockups of phone screens, tweets, or youth cultural references like current memes or celebrity news. On the other hand, we wanted to ensure that the game would be relevant to diverse demographics with different interests, digital proclivities, and political stances, and hold long-term appeal irrespective of current fads, trends, or technologies. Ultimately, we decided that the latter consideration outweighed the former in our particular context, but this is a significant tension that merits further thought within the sphere of contemporary media literacy education efforts.

Another key point of tension had to do with the integration of purposeful support for the learning objectives of the game. As others have noted, writing on the design of educational games (Ke, 2016; Plass et al., 2011), a good balance between the educational and, respectively, fun aspects of such games is of paramount importance.

In our case, we noted an additional challenge when playtests revealed that students and educators had divergent opinions as to what this balance should look like: students preferred a less didactic approach, while educators wanted to see a more explicit foregrounding of the learning objectives. In such cases, we strived to address the cognitive, motivational, and aesthetic needs of our target audience and, therefore, ensure that the game was appealing to youth. At the same time, acknowledging that teachers' perceptions of the educational potential of games are a major factor impacting the actual use of games in the classroom (Huizenga et al., 2017), we implemented educators' feedback by developing learning resources (e.g. lesson plans, post-game activities) around the game as a way to maximize its educational impact[3]. These resources also spelled out how the game addresses curricular standards, as a way to further facilitate curricular integration – which is a known challenge for media literacy education (Meehan et al., 2015; Stein et al., 2009).

A related challenge, in terms of game mechanics and playability, is the tension between the game needing to

[3] See www.lamboozled.com for downloadable examples

be easily and quickly understandable, while simultaneously enabling deep learning; we felt that the game mechanics needed to be simple in order to facilitate the former and complex in order to facilitate the latter. Our way of addressing, or perhaps assuaging, these challenges was to structure gameplay as a series of multiple quick rounds, as modeled by the *cycles of expertise* principle (Gee, 2004), to deepen learning, while keeping the mechanics rather simple – even if this meant sacrificing some of the more nuanced learning objectives. Furthermore, the design of the game as multiple quick rounds was also meant to facilitate classroom implementation across contexts as this design allowed for variable game durations (depending on the time available to the teacher or facilitator) and accommodated a variable number of players (two-six individual players or pairs, or technically 2-12 players per card deck).

The process of iterative design itself, an important tool in the practice of instructional design (Jonassen, 2008), provided us with many opportunities, but also raised some challenges worth considering. On the one hand, we derived invaluable information from this process as playtesting revealed ineffective design solutions or aspects of the design that were not previously apparent; indeed, in retrospect, each "step back" helped us take several steps forward. At the same time, for each iteration of the design, it was challenging and costly (in terms of both time and resources) to decide when and what to iterate.

This decision was further complicated by the fact that there were often contradicting opinions from different stakeholders (i.e., youth vs. educators) as exemplified earlier. In deciding whether to revise the game and the scope of revision, our approach was to iterate when problems surfaced related to a) the attainment of the learning goals (i.e., when the design or a specific aspect of the game failed to support the learning objectives of the game through its mechanics, dynamics, and aesthetics), b) playability (i.e., when the design or aspects thereof created confusion or barriers to engagement in gameplay), and c) implementation (i.e., when the design or aspects thereof complicated the practical implementation of the game in classrooms or limited the versatility of its educational applications).

CONCLUSION

In this article, we have demonstrated the application of a multi-level game design framework to the design and development of a research-based educational game about news literacy, thus illuminating our iterative design process, as well as the challenges, opportunities, and key decision points arising at different moments in the design process.

It is our hope that, by shedding light on the process of developing game-based approaches to media literacy, we might provide useful insights for researchers, designers, educators, and practitioners working in game design, media literacy education, or the intersection of the two.

Our game, *LAMBOOZLED!*, is published by Teachers College Press. Going forward, we are continuing our research into game-based and participatory approaches to media literacy education and possibly expanding the *LAMBOOZLED!* universe into the digital realm. In this initial stage, the game took the form of a non-digital card game. This format foregrounds social aspects, which can be a significant boon to the effectiveness of both game-based learning (Steinkuehler & Tsaasan, 2020) and media literacy education (Hobbs, 2010; Mihailidis & Thevenin, 2013). Secondly, the non-digital nature of the game allows for its implementation in a wide range of educational contexts, including those with lower technological resources. But, what would a digital game look like, and how might we create a digital experience that valuably taps into our learning objectives and is uniquely positioned to do so (i.e., a digital game that harnesses the affordances of the digital medium rather than merely replicating the design of the offline game in a digital setting)?

Thinking about game-based approaches and beyond, we also see a need to further probe strategies of engaging youth more centrally in media literacy education. As scholars and educators who believe strongly in the potential of participatory approaches to both research and educational practice, we have always advocated for the significance of agency and ownership in these contexts; at the same time, we acknowledge that the game-based initiative written about here only involved youth in a consultative capacity but not in a truly collaborative sense.

Thinking about future directions, we are intrigued and invigorated by the potential to engage youth more directly in the development of media literacy educational initiatives. Game design can present a promising avenue to do so (Literat et al., 2020) but only if the design process itself is rethought in a way that is quintessentially participatory, collaborative, and youth-centered.

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